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Session MRD-02 "Deep sources and signatures of ore-forming systems - a tool for new discoveries in ore deposits" (Convincers: L. Cathles and S. Cherkasov) was sponsored by the International Association on the Genesis of Ore Deposits (IAGOD) and the Russian-French Metallogenic Laboratory. Three participants have obtained support from Geohost program.

The researches were invited to submit papers on the issues related with energy aspect of ore forming processes including tracing ore forming paleosystems in a scale of Earth crust. 14 papers were presented orally, 3 as posters (2 no-shows at the poster session). Total number of participants including listeners – about 35.

The session was opened with a keynote presentation (S. Cherkasov, Vernadsky SGM RAS/ Russian-French Metallogenic Laboratory) outlining general idea on importance of tracing signatures and studying geometry of energy paleo-sources representing an engine for endogenic ore-forming processes along with some examples of such studies in Russia and CIS countries. Two more keynote talks were given by Lawrence Cathles (Cornell University) proposing to study large mid-crustal sills by receiver function analysis and by Richard Blewett (Geoscience Australia) describing deep signatures of a world-class Archaean gold system in Australia.

Subsequent talks focused on different issues related to the topic including examples of recent researches in Australia (two different studies presented by L. Feltrin from the James Cook University, K. Gessner, The University of Western Australia), China (J. Deng, China University of Geosciences), Egypt (H. Helmy, Minia University), Uzbekistan (I. Sidorova, Institute of Geology & Geophysics), Russian Aldan shield (N. Vishnevskaya, poster, Vernadsky SGM RAS).

Another group of presentations described methods of studying the deep structure of Earth crust with emphasis on the traces of ore-forming systems. Larry Brown (Cornell University) suggested use of seismic methods for detection of crustal fluids, R. Zhang (Institute of Mineral Resources, Chinese Academy of Geological Sciences) talked about physical-chemical modelling of hydrothermal transport, M. Esfahaninejad (Geological survey of Iran) demonstrated GIS usage for modelling porphyry copper deposits. Also, a model for the same type of deposits was presented by E. Puchkov (SBS Group, Kazakhstan). One extra (late submission) presentation on arc metallogenesis was done by K. Rebrina (Monash University, Australia).

A 30-minutes discussion was held after the presentation with 14 participants. The results of the session have indicated a really new approach to understanding metallogeny of ore deposits from the point of energy supply needed to facilitate the ore-forming process. It is also clear, that in many cases traces (remnants) of the heat-and-mass transport paleosystems can be fixed (at crustal scale) today with geophysical methods, and for mineral deposits of many types, some spatial correlation is being revealed between the elements of such systems and location of the deposits.

The participants have agreed to apply to International Association on the Genesis of Ore Deposits for establishment of an international working group on the subject.